91

WHITMOYER LABORATORIES, INC. 135363

19 NORTH RAILROAD STREET • MYERSTOWN, PENNSYLVANIA 17067 • PHONE (717) 866-2151

November 17, 1978

Mr. Narenda N. Desai
Air Pollution Control Engineer
Dept. of Environmental Resources
407 South Cameron Street
Harrisburg, PA 17120

Dear Mr. Desai:

Attached please find an amended application to modify our existing waste evaporation system, D.E.R. #38-313-010, as we have been discussing. We currently have all of the new equipment on hand and pre-fabricated. We would appreciate your verbal approval to start as soon as possible.

Very truly yours,

Lloyd J. Croesus

Lloyd J. Croesus
Safety & Environmental Manager

cc: J. P. Grab
H. M. Huffman
R. T. Kirst
T. E. Long
R. S. Rosera

Attachments

AR100303

ER-AQ-16:REV. 2/76

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF AIR QUALITY & NOISE CONTROL
Application for Plan Approval to Construct,
Modify or Reactivate an Air Contamination Source
and/or Air Cleaning Device or for a Permit to Operate

Read the instruction carefully before completing this form. Submit duplicate copies.

Section A Identity and Location of Air Contamination Source

1A. Application is being made for:

- [ ] Construction of New Source
- [ ] Reactivation of a Source
- [x] Modification of Existing Source
- [ ] Installation of Air Cleaning Device
- [ ] Extension of Plan Approval
- [x] Amendment to a Previous Application
- [ ] Operating Permit
- [ ] Temporary Operating Permit
- [ ] Extension of Operating Permit

1B. Type of source

Arsenical Waste Evaporation System

1C. Plant in which source is located	1D. Expected date of completion
[ ] NEW [x] EXISTING	11-22-78

1E. If source is new, does it replace another source (describe source replaced) [ ] YES [x] NO

2A. Owner of source	2B. Employer I.D. No. (Federal)
Whitmoyer Laboratories	23-164-0660

3A. Owners designation of source and/or plant if any

Myerstown Plant - Bldg. #2

3B. Location of source (Street address or Route No.)	Political Subdivision (Township, etc.)	County
Fairlane Avenue Myerstown, PA 17067	Jackson Township	Lebanon

3C. Mailing address (Street or P.O. Box, City, Zip Code)	3D. Telephone No.
19 N. Railroad St. Myerstown, PA 17067	717-866-2151

4. Official signing application must be an agent of the Company having primary responsibilities for operation of the facility to which this application applies. Although he may not have participated in the design of the facility he should be responsible for approval of the design.

AFFIDAVIT

I Richard S. Rosera, being duly sworn according to law depose and say that I am the official having primary responsibility for the design and operation of the facilities to which this application applies and that the information included in the foregoing application is true to the best of my knowledge, information and belief.

Sworn to and subscribed before me this 17th day of November

Richard Rosera
Signature

Notary Public

NOTARY PUBLIC
LEBANON COUNTY, PA.
MY COMMISSION EXPIRES MAY 5, 1980

Chemical Manufacturing Area Manager
Title

AR100304

Section B – Process Information

1. PROCESS EQUIPMENT

A. Manufacturer of Source	B. Model No.	C. No. of units
DeDietrich & Cie Niederbrown (1966)	Mfgs. #7541	1

D. Rated Capacity

of total evaporation system = 526 GPH maximum

E. Rate under normal operation (Describe variations)

See Addendum E

F. Describe the process equipment (Give type, use, product, etc. on attached sheet)

One 1000 gallon glass-lined evaporator; One 600 ft.^{2} Karbate heat exchanger to preheat evaporated steam, One Heil Rigidon #4580 Accumulator-Demister vessel; One 6" x 24" dia. Teflon York demister pad; One 12" dia. fiberglass stack.

G. Sketch flow diagram of process giving all (gaseous, liquid, and solid) flow rates (attach separate sheet). Also list all raw materials charged to process equipment and the amounts charged (tons/hour, etc.) at rated capacity (give maximum, minimum and average of both normal and occasional charges).

See Addendum A

2. OPERATING SCHEDULE

24 hours/day 5 days/week 50 weeks/year

3. SEASONAL PERIODS (MONTHS)

Operating: January to December

Non-Operating: _____ to _____

4. Describe fully the facilities provided to monitor and record all operating conditions that may affect the emission of air contaminants. Provide detailed information to show that the facilities provided are adequate.

See Addendum B & B1

5. Describe modifications to process equipment in detail

Addition of new Futura Titanium Heat Exchanger, type 14-4-192 BEM, 293 ft.^{2} in parallel wi above Karbate exchanger; Karbate exchanger normally physically disconnected--to be used as a back-up. Addition of new York Titanium Ultra-Efficient Style 326 demister, 6" x 24" dia., to be placed in series after existing demister. Change acid addition point per Addendum A. Add instrumentation to measure steam flow volume to heater.

6. Type and method of disposal of all waste materials generated by this process
(Is a Solid Waste Disposal Permit Needed? ☐ Yes ☒ No)

The liquid stream is totally contained and recycled. The solids are removed as a wet cake by centrifugation. They are drummed and sent out-of-state for disposal.

7. Briefly describe the method of handling the waste water from this process and its associated air pollution control equipment
(Is a Water Quality Management Permit needed? ☐ Yes ☒ No)

All water is internally recycled except for the evaporated water vapor.

8. Attach any and all additional information necessary to perform a thorough evaluation of the extent and nature of emissions from this process.

Section C - Control Equipment

1. POTENTIAL PROCESS EMISSIONS (OUTLET FROM PROCESS, BEFORE ANY CONTROL EQUIPMENT)

Actual plant tests from August 7 to October 4, 1978

A. Outlet particulate loading (lbs/hr or gr/SCF Dry)

Total Chlorides	Minimum = 0.000006 lbs./hr. Mean = 10.88 lbs./hr. Maximum = 35.57 lbs./hr.	43 samples	
Total Arsenic	Minimum = 0.459 lbs./hr. Mean = 6.49 lbs./hr. Maximum = 24.93 lbs./hr.	44 samples	

B. Specific gravity of particulate

$NaCl = 2.17$; $NH_4Cl = 1.54$; $H_3AsO_4 \cdot \frac{1}{2}H_2O = 2.11$ @ 25°C.; $C_6H_5CLN = 1.22$

C. Attach outlet particle size distribution information

Not Available

D. Specify gaseous contaminants and concentration 44 samples

		Contaminant	Concentration		
Min.	(1)	Aniline	0.1	% =	0.92 lbs/hr
Mean	(2)	Aniline	0.65	% =	14.5 lbs/hr
Max.	(3)	Aniline	2.9	% =	58.9 lbs/hr

E. Outlet volume of exhaust gases @ 300 gph rate

1155 ACFM

@ 212 °F

2. GAS CONDITIONER (IF APPLICABLE)

Not Applicable

A. Water quenching ☐ Yes ☐ No

Water injection rate _____ GPM

B. Radiation and convection cooling ☐ Yes ☐ No

C. Air dilution ☐ Yes ☐ No _____ CFM

D. Gas conditioner outlet

_____ ACFM @ _____ °F

3. SETTLING CHAMBERS (IF APPLICABLE)

Heil Rigidon #4580 Accumulator-Demister Vessel

A. Manufacturer

Heil Process Equipment Company
Div. of Dart Industries

In Care of

George Kelso Company
P. O. Box 34
Upper Darby, PA 19084

B. Volume of gas handled @ 300 gph rate

1155 ACFM @ 212-250 °F

C. Gas velocity at 300 gph rate

inlet = 5880 fpm; surge tank = 92 fpm; demister = 400 fpm; 12" stack = 1470 fpm

D. Dimensions

See Addendum D

E. Retention time

ca 2.6 seconds @ 300 gph rate

F. Describe baffling

None

G. Inlet concentration (lbs/hr or gr/SCF Dry)

As above in Section No. 1 of this page

H. Outlet concentration (lbs/hr or gr/SCF Dry)

Unknown

I. Overall efficiency (%)

See overall system efficiency on Page 4.

J. Water injection

☐ Yes ☒ No

K. Water injection Rate (GPM)

L. Attach particle size Efficiency curve

Not Available

AR100306

Section C - Control Equipment. Continued

9. ABSORPTION AND ABSORPTION EQUIPMENT (IF APPLICABLE)

A. Manufacturer	B. Type	C. Model No.

D. Volume of gases handled (ACFM)	E. Inlet temperature (°F)

F. Design inlet volume (ACFM)	G. Pressure drop (water gage)

H. Absorbent or adsorbent	I. Retention time (sec)

J. Inlet concentration	K. Outlet concentration	L. Overall efficiency (%)

M. Method and frequency of regeneration

N. Describe absorption or adsorption equipment fully

10. OTHER CONTROL EQUIPMENT (IF APPLICABLE)

Demisters (2) in series

A. Manufacturer	B. Type	C. Model No.
Otto H. York Company, Inc.	Primary = teflon Secondary = titanium	Primary = style #221 Secondary = style #326 both 6" thick, 24" diam.

D. Volume of gases handled (ACFM)	E. Design inlet volume (ACFM)	F. Inlet temperature (°F)
@ 300 gph = 1155 ACFM	1862	212-240

G. Inlet concentration (lbs/hr or gr/SCF Dry)	H. Outlet concentration (lbs/hr or gr/SCF Dry)	I. Overall efficiency (%)
Unknown	See below	See below

J. Attach particle size efficiency curve or other efficiency information
See Addendum F

K. Describe fully giving important parameters and method of operation

Data of actual plant tests from August 7 to October 4, 1978

Outlet emissions from primary demister: 44 samples

Total Chlorides	Minimum = 0 lbs./hr.	
	Mean = 0.637 lbs./hr.	
	Maximum = 6.15 lbs./hr.	
Total Arsenic	Minimum = 0.003 lbs./hr.	
	Mean = 0.033 lbs./hr.	
	Maximum = 0.439 lbs./hr.	
Aniline	Minimum = 1.10 lbs./hr.	
	Mean = 10.0 lbs./hr.	
	Maximum = 30.25 lbs./hr.	

Combined efficiencies of surge tank & primary demister

Total Chlorides	Minimum = 10.3%	
	Mean = 92.89%	43 samples
	Maximum = 100%	
Total Arsenic	Minimum = 95.0%	
	Mean = 99.42%	44 samples
	Maximum = 99.98%	
Aniline	Minimum = 0.6%	
	Mean = 32%	39 samples
	Maximum = 69.3%	

Section C - Control Equipment, Continued

11. COSTS

A. Cost of all control equipment including installation costs (List individual controls separately)

$ 570.00 = Titanium demister
278.00 = Fiberglass spoolpiece + demister holddown ring
52.24 = 2 gals. resin & catalyst + 100 ft. glass fiber.
299.76 = Estimated installation
$1200.00

Titanium heat exchanger = $15,000. Estimated costs for installation of above + costs for changing acid addition point + costs of steam volume instrumentation & installation = $10,000.

B. Estimated annual operating costs

Maintenance plus steam.

12. Describe modifications to control equipment in detail

See Addendums A + D

13. Discuss briefly the noise potential of the process and related control equipment and describe any devices used to reduce noise. Give costs.

Actual measurements: 70-80 dB (A)

14. Attach manufacturer's performance guarantees and/or warrantees for each of the major components of the control system (or complete system).

15. Attach the maintenance schedule for the control equipment and any part of the process equipment that if in disrepair would increase the air contaminant emissions. Periodic maintenance reports are to be submitted to the Department.

Demister section will be dismantled and visually inspected at least (3) times a year.

16. Attach any and all additional information necessary to thoroughly evaluate the control equipment.

Section D - Flue And Air Contaminant Emission Information

1. STACK AND EXHAUSTER

A. Exhauster (attach fan curves) NONE _____ HP @ _____ RPM

B. Stack height (ft)	C. Stack diameter (ft)	D. Weather cap
54 above ground level	1.0	☐ Yes ☒ No

E. Indicate on an attached sheet the location of sampling ports with respect to exhaust fans, breeching, etc. Give all necessary dimensions.

SEE ADDENDUM C

F. Can the control equipment be bypassed? (If Yes, explain) ☐ Yes ☒ No

2. ATMOSPHERIC EMISSIONS

A. Particulate matter emissions (lbs/hr or gr/SCF Dry)

B. Gaseous contaminant emissions → Emissions are currently as reported in Section 10 on Page 4. The addition of the secondary demister, according to the manufacturer will remove ca 99% of the remainder above a 4 micron mist size.

Contaminants	*Concentration*	
(1)	_____ ppm (Vol.)	_____ lbs/hr
(2)	_____ ppm (Vol.)	_____ lbs/hr
(3)	_____ ppm (Vol.)	_____ lbs/hr

C. Outlet volume of exhaust gases

1155 CFM @ 300 GPH Rate

212 °F

almost 100 % Moisture

AR100309

Section E - Miscellaneous Information

1. Describe fully facilities to monitor and record the emission of air contaminants. Provide detailed information to show that the facilities provided are adequate. Include cost and maintenance information. Periodic maintenance reports are to be submitted to the Department.

A sample tube will be inserted and permanently attached near the exhaust end of the stack. The tube will run down the side of the stack into the building. Samples will be collected through this tube and analyzed for contaminants.

Also see Addendum G.

2. Attach Air Pollution Episode Strategy (if applicable)

Operation will be shut-down as specified in Temporary Operating Permit.

3. Briefly describe the general nature of the area in which the source is located.

The Myerstown plant is located in a farming community with a very low population density.

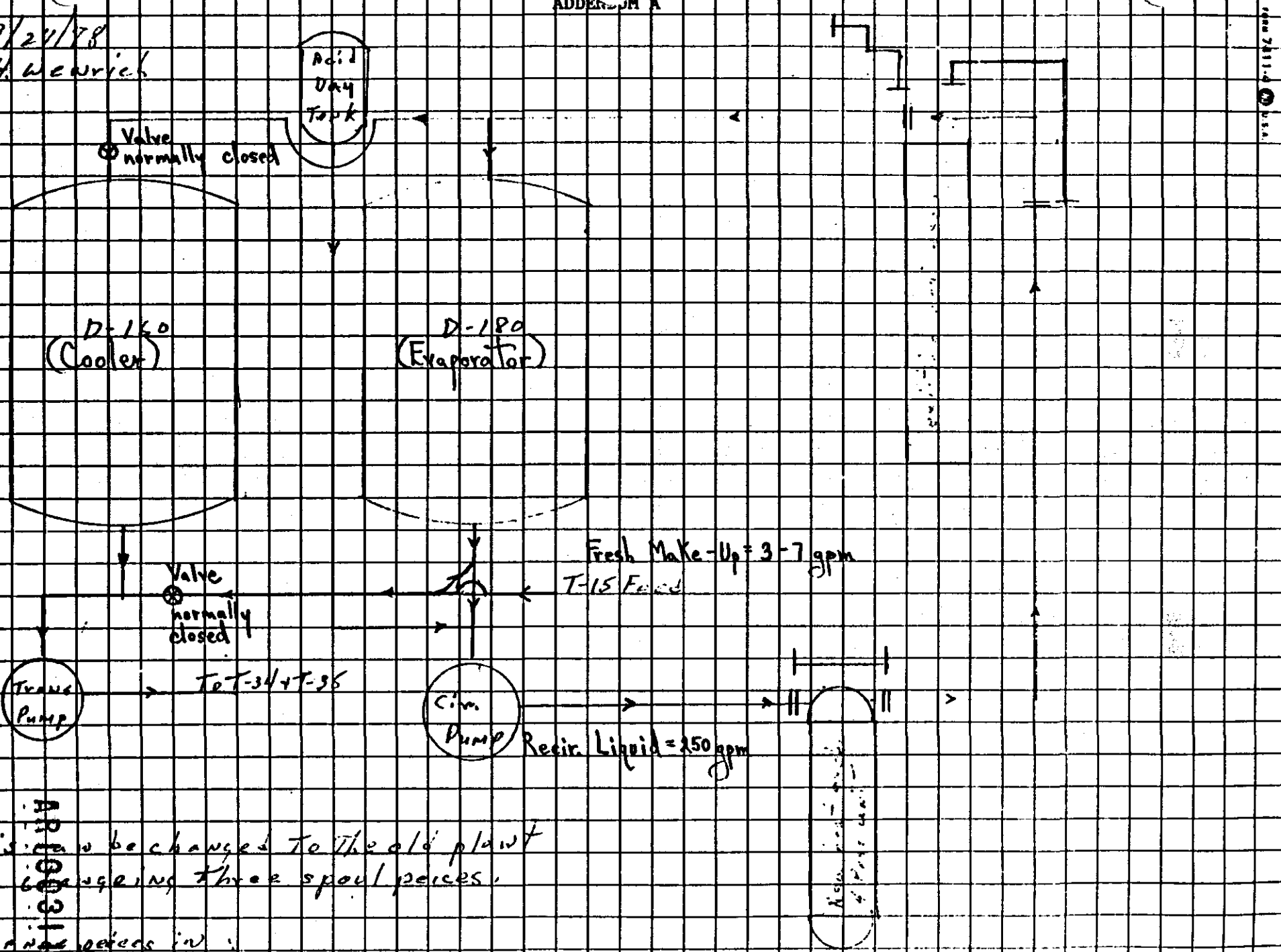
4. Attach calculations and any additional information necessary to thoroughly evaluate compliance with all the applicable requirements of Article III of the Rules and Regulations of the Department of Environmental Resources and those requirements promulgated by the Administrator of the United States Environmental Protection Agency pursuant to the provisions of the Clean Air Act.

5. List all attachments made to this Application.

Addendum A - Changes to general operating scheme.
Addendum B - Facilities to monitor operating conditions.
Addendum C - Stack sampling location.
Addendum D - Detail of surge tank and demisters.
Addendum E - Summary of rate experience.
Addendum F - Design calculations for surge tank and demisters.
Addendum G - Volume measurements and sampling procedures.
Addendum H - York demister data sheet

ADDENDUM A

9/24/78
H. Wenrick



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AR100311

This can be changed to the old plant by changing three spool pieces.

Change pieces in:

ADDENDUM B

(A) Maintain log of acid added to adjust pH to less than 1.7 to tie up aniline and ammonia as hydrochloride salts.

(B) Capacitance probe used inside evaporator as high level alarm to monitor foam.

(C) Maintain continuous plant log sheets of operating data as per attached Addendum B-1.

(D) Evaporator contents temperature will be recorded continuously.

(E) Stack will be sampled and analyzed on a regular basis for contaminants by collecting condensate as per Addendum C and G.

ADDENDUM

WASTE EVAPORATION DATA SHEET

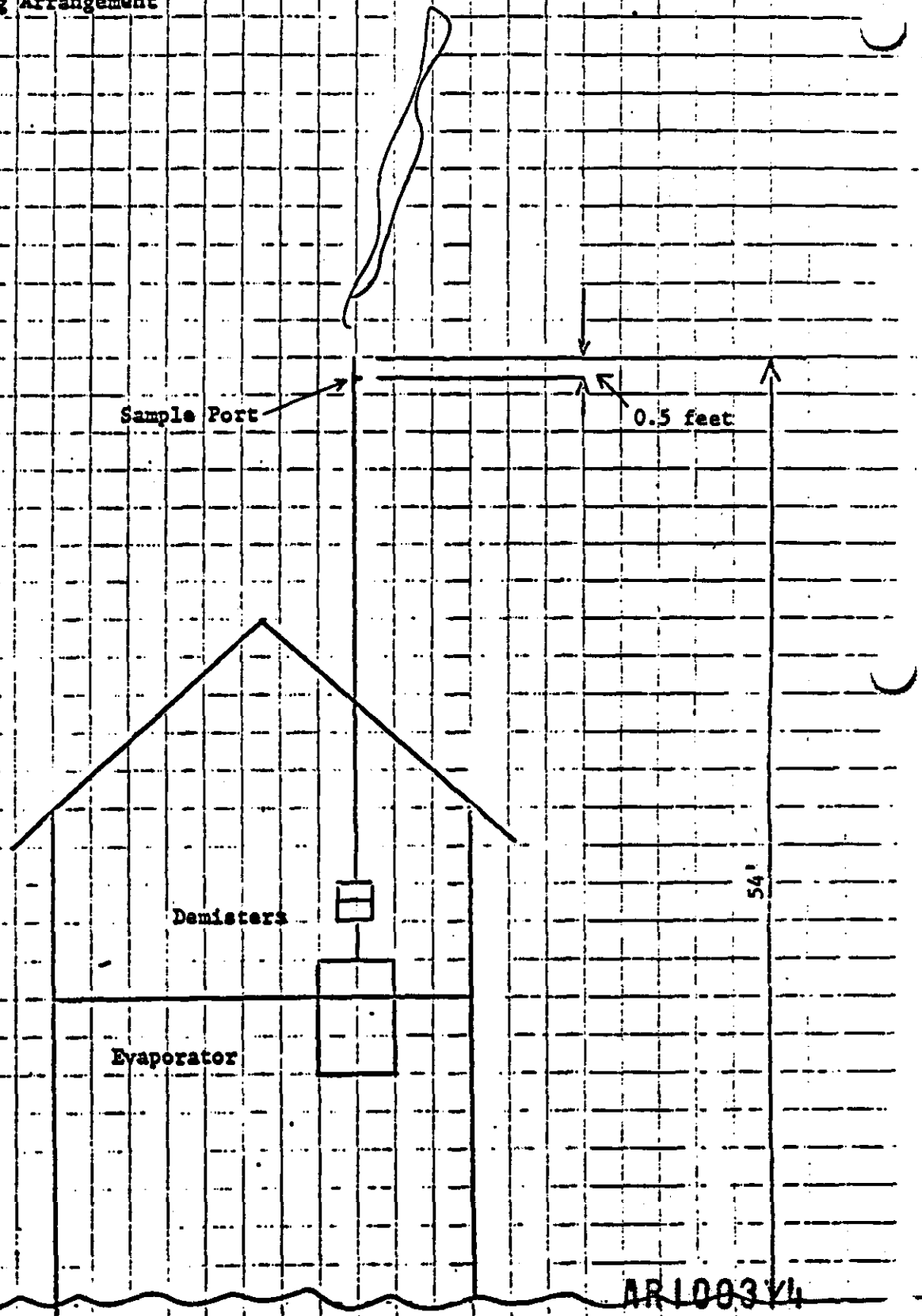
Date Start of Sheet: _____ Date End of Sheet: _____ SHIFT: _____

Time	Seal Flow Rate GPH	PRESSURES			D-180 Temp.	Steam Flow Rate To Heater	Volume in T-15		Gals. Evap.	pH D-180	Stack Conden. pH	Acid Added (Gals.)	(Mils) Salt	20 Max. Motor Amps
		Pump Outlet	Heater Outlet	Steam To Heater			Inches	Gallons						

COMMENTS:

ADDENDUM C

Stack & Sampling Arrangement



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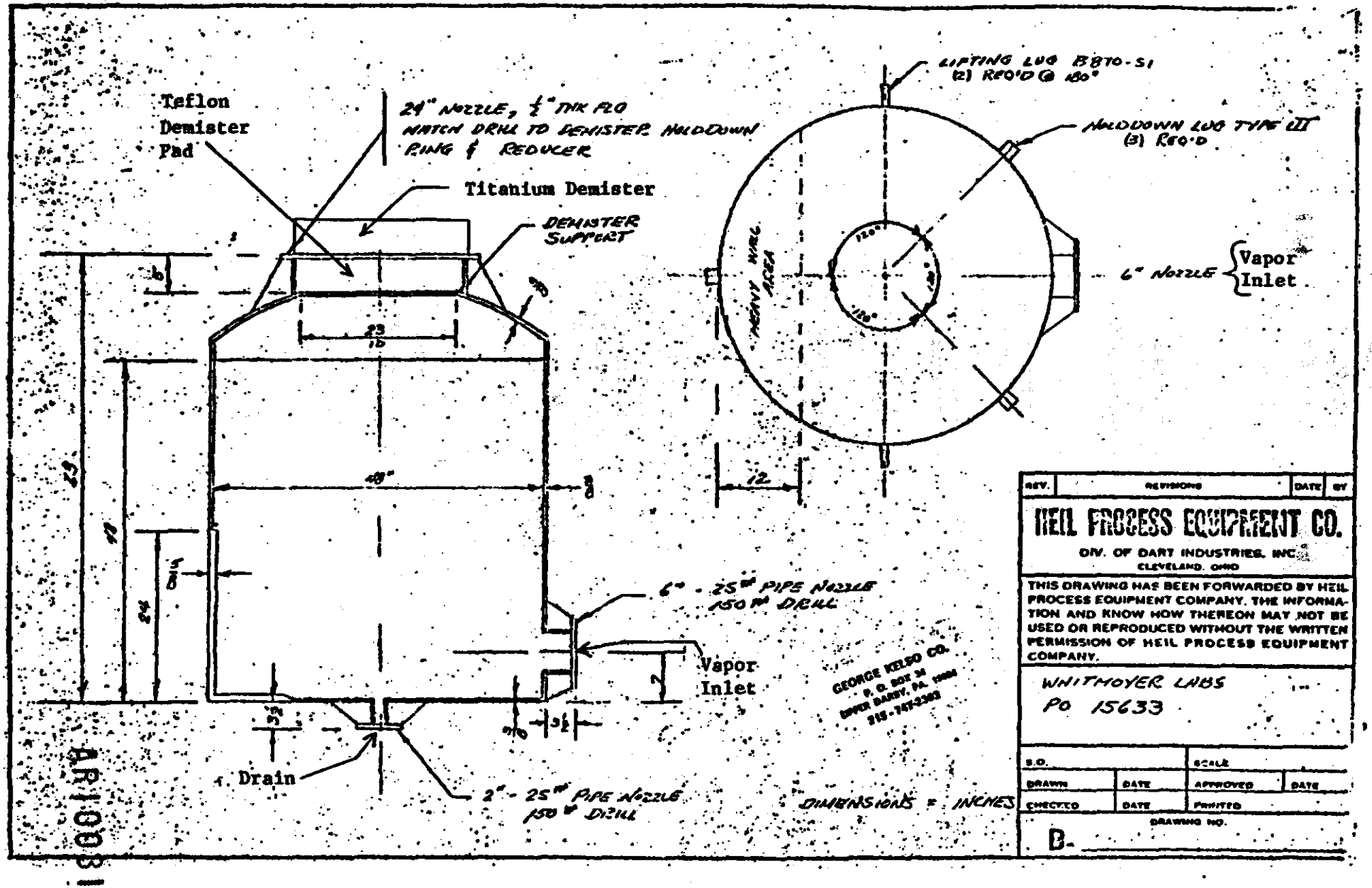
ADDENDUM D



AR100315

ADDENDUM E

DATE STAMP

MEMO

WHITMOYER LABORATORIES, INC.

MYERSTOWN, PENNA., U. S. A.

Date October 31, 1978

To Those Listed

From Mr. L. J. Croesus

cc:

Mr. J. P. Grab
Mr. H. M. Huffman
Mr. T. E. Long
Mr. R. S. Rose

Subject: ARSENICAL WASTE EVAPORATION RATES WITH KARBATE HEAT EXCHANGER

All of the samples taken by Mr. Long from August 7 till October 4, 1978 were compiled. Statistical values are summarized on the attached. This covers all of the samples taken after the surge tank installation and before the titanium heat exchanger. Samplings were grouped by steam pressure to heater.

Standard deviation and variance were both calculated using N-1 weighting. N-1 is an unbiased estimator customarily used for sampled data as opposed to N weighting which results in a maximum likelihood estimator that is generally used to describe populations. Variance is the square of the standard deviation.

We can determine how well the linear curve actually does fit the data without constructing a plot of the variables (scatter diagram) and drawing the best straight line which uniformly divides the data points. An accepted practice is to perform a least-squares linear regression which is designed to minimize the sum of the squares of the deviations of the actual data points from the straight line of best fit. Because the data may not be best represented by a straight-line curve, it is desirable to measure how well the linear curve actually does fit the data. This measure of the degree of association between the variables is called the correlation coefficient. The value will be between ±1., with ±1.000 being a perfect correlation. The coefficient was determined, for the 44 samplings of the attached evaporation data, to be +0.213.

It would appear to this writer that the great variation in actual chemical content of the waste feed, plus the inaccuracies in our measuring methods, jointly have a much more significant effect on our calculated rates than we have been assuming.

L. J. C.

AR100316

ADDENDUM E

ARSENICAL WASTE EVAPORATION SYSTEM WITH KARBATE HEAT EXCHANGER

Steam Pressure To Heater (psi)	No. of Samplings	Evaporation Rates (gals./hr.)				
		Minimum	Mean	Maximum	Standard Deviation	Variance
20	1	52.	—	—	—	—
30	5	87.	304.4	514.	187.2	35029.
35	18	131.	253.4	349.	69.3	4801.
40	11	129.5	312.6	482.	100.2	10044.
40 - 43	2	496.	511.	526.	21.2	450.
42 - 44	1	239.5	—	—	—	—
45	5	197.	252.7	307.	43.4	1887.
46 - 50	1	242.	—	—	—	—

K.J.C.
10-30-78

ADDENDUM F

July 25, 1978

YORK DEMISTER - SURGE TANK DESIGN

1. Vapor velocity equation for York Demister:

$$U = K\sqrt{\frac{D_L - D_V}{D_V}}$$, with velocities from 30% to 110% of the calculated optimum velocity being satisfactory for demisting.

Where: K = constant = 0.35

D_V = vapor density, lbs./ft.^{3} = $\frac{1 \text{ lb.}}{26.83 \text{ ft.}^3}$ @ 212°F

D_L = liquid density, lbs./ft.^{3} = 59.8 lbs./ft.^{3} @ 212°F

U = velocity, ft./sec.

$$U = 0.35\sqrt{\frac{59.80 - \frac{1}{26.83}}{\frac{1}{26.83}}}$$

= 14.02 ft./sec. or 840.9 ft./min.

Satisfactory velocity range for demisting:

MINIMUM = 0.30 U = 0.30 x 840.9 ft./min = 252.3 ft./min.

MAXIMUM = 1.10 U = 1.10 x 840.9 ft./min = 925.0 ft./min.

Evaporation rates corresponding to satisfactory demisting action:

Demister cross-sectional area = $\pi \frac{D^2}{4} = \frac{\pi}{4} \times 23^2 \text{ in.}^2 \times \frac{1 \text{ ft.}^2}{144 \text{ in.}^2} = 2.885 \text{ ft.}^2$

Conversion factor: $1 \frac{\text{gal.}}{\text{hr.}} \times \frac{8.334 \text{ lbs.}}{\text{gal.}} \times \frac{1 \text{ hr.}}{60 \text{ min.}} \times \frac{26.83 \text{ ft.}^3}{\text{lb.}} = 3.727 \text{ ft.}^3/\text{min.}$

MINIMUM: 2.885 ft.^{2} x 252.3 ft./min. = 727.9 ft.^{3}/min.

$\frac{727.9 \text{ ft.}^3/\text{min.}}{3.727 \text{ ft.}^3/\text{min.}}$ = 195 gal./hr.

MAXIMUM: 2.885 ft.^{2} x 925.0 ft./min. = 2668.9 ft.^{3}/min.

$\frac{2668.9 \text{ ft.}^3/\text{min.}}{3.727 \text{ ft.}^3/\text{min.}}$ = 716 gal./hr.

OPTIMUM: 2.885 ft.^{2} x 840.9 ft./min.= 2426.2 ft.^{3}/min.

$\frac{2426.2 \text{ ft.}^3/\text{min.}}{3.727 \text{ ft.}^3/\text{min.}}$ = 651 gal./hr.

ADDENDUM F

July 25, 1978

YORK DEMISTER - SURGE TANK DESIGN (CONT'D)

2. Surge tank gravity settling limit:

$$200 \frac{\text{ft.}}{\text{min.}} \times \frac{\pi}{4} \times 4 \text{ ft.}^2 \div 3.727 \text{ ft.}^3/\text{min.} = 674 \text{ gal./hr.}$$

3. Conclusion:

The combination of demisting action and gravity settling by the surge tank should be satisfactory between evaporation rates of 195 gal./hr. (minimum vapor velocity limit) and 674 gal./hr. (gravity settling limit).

RS Rosera

Richard S. Rosera

ADDENDUM G

MEMO

WHITMOYER LABORATORIES, INC.

MYERSTOWN, PENNA., U. S. A.

cc:

Date September 11, 1978

To L. J. Croesus

From T. E. Long

DATE STAMP

Subject: WASTE EVAPORATION VOLUME MEASUREMENTS AND SAMPLING PROCEDURES

The volume measurements are being calculated as follows:

Waste Tank #15 is filled to capacity (4,405 gal.),at the same time evaporator D-180 is filled to normal operating level (800 gal.). The steam pressure is reduced to 15 lb. p.s.i. during the filling process. A measurement is taken of the wet space in T-15 and the volume determined by means of a calibration chart. This measuring procedure is repeated at the end of the test cycle. This is done while maintaining the normal operating level (800 gal.) in evaporator D-180. No waste is permitted to be added to T-15 during test cycle.

A 30 gallon drum is used to collect condensate from the surge tank. This is condensed vapor that has come out of the evaporator but is not leaving by the final stack emission. A measurement is taken of the wet space and calculated from a calibration chart.

The volume of vapors leaving the evaporator is calculated from the difference in volume in T-15. The volume for the final stack emission is calculated by subtracting the surge tank condensate from the above number.

The sampling technique being used is as follows:

A stainless steel tube is inserted into the vapor arm coming off the evaporator before the surge tank to collect the vapor leaving evaporation. Another stainless steel tube is inserted in the final stack 6 inches from the discharge end. These two tubes are connected by plastic tubing to two sets of flasks operated in parallel. This allows us to simutaneously collect both types of samples. This is described in the attached drawing.

Terry E. Long

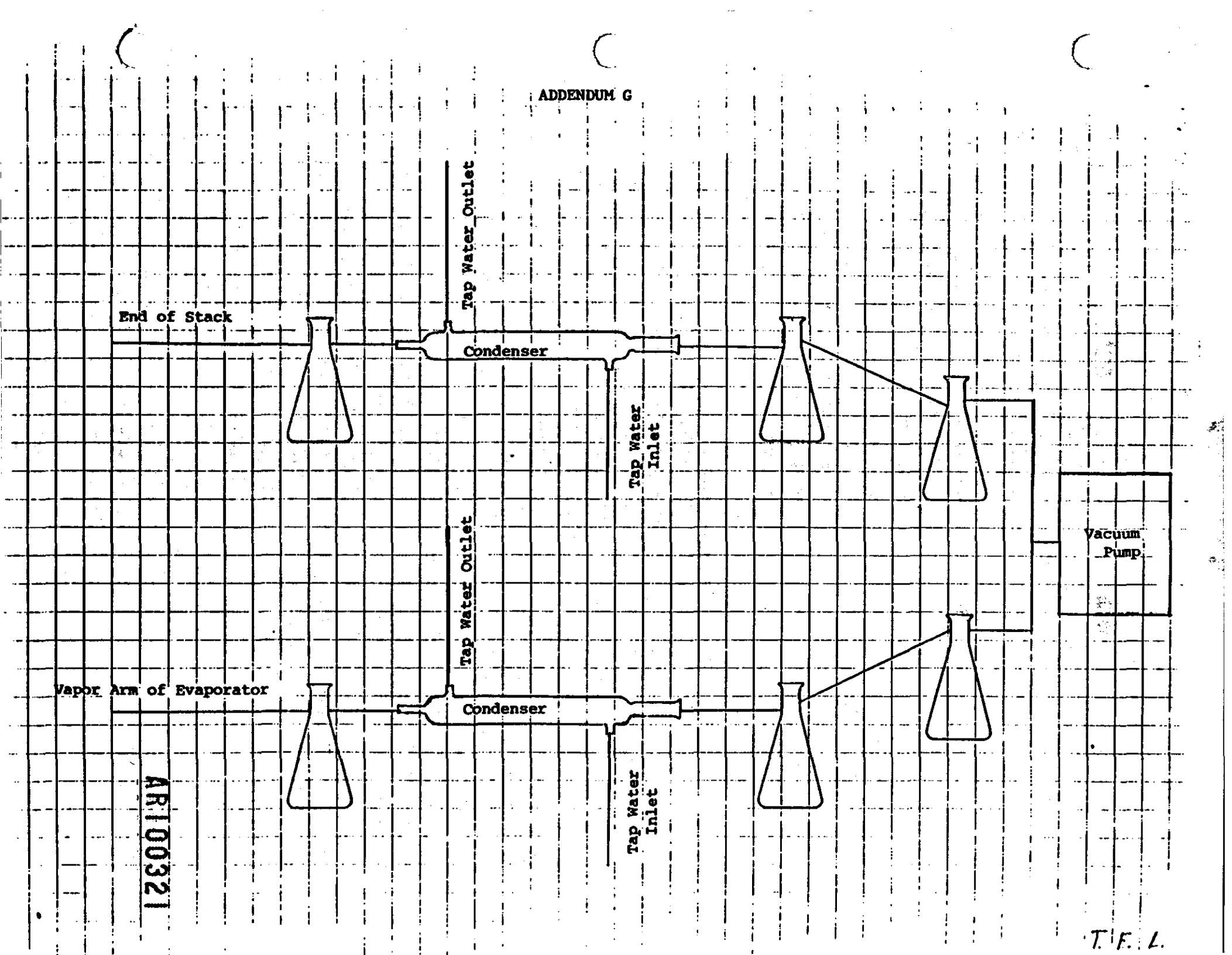
Terry E. Long

TEL/njw

Attachment

AR100320

ADDENDUM G



AR10321

T. F. L.

BULLETIN 50

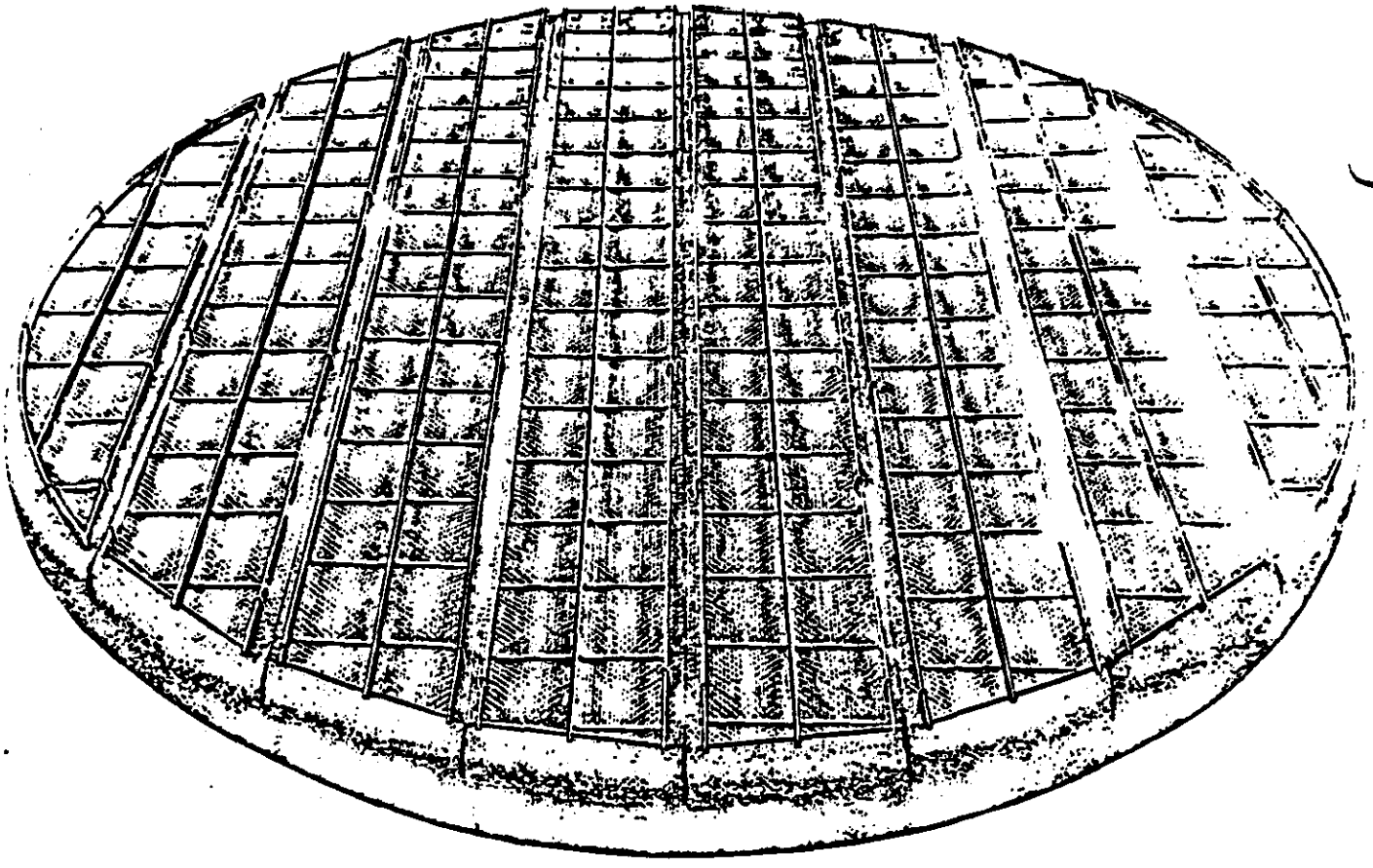
THE DEMISTER®

MIST ELIMINATOR ENTRAINMENT SEPARATOR

- INCREASES THROUGHPUT CAPACITY
- IMPROVES PROCESS EFFICIENCY
- IMPROVES OVERHEAD QUALITY
- ELIMINATES COSTLY LIQUID LOSS
- REDUCES PRODUCT CONTAMINATION
- SOLVES AIR POLLUTION PROBLEMS

...for the separation of mist and entrained liquid from any vapor stream

- EASY TO INSTALL
- NO MOVING PARTS
- LOW PRESSURE DROP
- LIGHT WEIGHT
- FITS ALL PROCESS EQUIPMENT
- REQUIRES NO MAINTENANCE
- PROMPT SHIPMENT IN ALL MATERIALS OF CONSTRUCTION



Demister is a registered trademark of Otto H. York Company, Inc.

YORK

OTTO H. YORK COMPANY, INC.
P.O. Box 2100
Fairfield, New Jersey 07006
(201) 575-6960/6966 Telex: 139134

THE DEMISTER®

Where the Demister is used and how it benefits the user

Air Pollution Prevention

The Demister prevents contaminants from being discharged into the atmosphere. These include such objectionable materials as sulfuric acid, elemental sulfur, chemical discharge from pulp mill smelt dissolver vent stacks, quench towers, and a wide variety of scrubber solutions.

An impingement type scrubber designed to remove calcined clay dust from 15,000 ACFM air at temperatures up to 200°F was allowing 70 pounds per hour of solids to escape to atmosphere, against the 36 pounds per hour maximum allowed by state authorities. After the installation of a 6-inch-thick Demister and spray nozzles for back washing, the carryover rate was reduced to an acceptable 21 pounds per hour.

Evaporators

The Demister eliminates carryover loss of valuable product—or by preventing carryover of non-volatiles produces high quality condensate suitable for process or boiler feedwater use or human consumption.

In a desalination plant Demister mist eliminators were installed in both stages of a two-effect, falling-film evaporator. Salt concentration in the water ranged from 35,000 ppm to 76,000 ppm. On-stream tests showed the Demister reduced salt concentration to about 2.5 ppm in the condensate, significantly less than the plant performance guarantee.

Distillation Equipment

Improved performance is obtained in equipment handling lube oil, naphtha and propane from asphalt, petro-chemicals, organic intermediates, fine chemicals, etc.

A distillation column failed to produce an overhead chemical intermediate product of the high degree of purity required for pharmaceutical manufacture. The installation of a high efficiency style Demister made it possible to obtain the high purity required.

Knock out Drums and separators

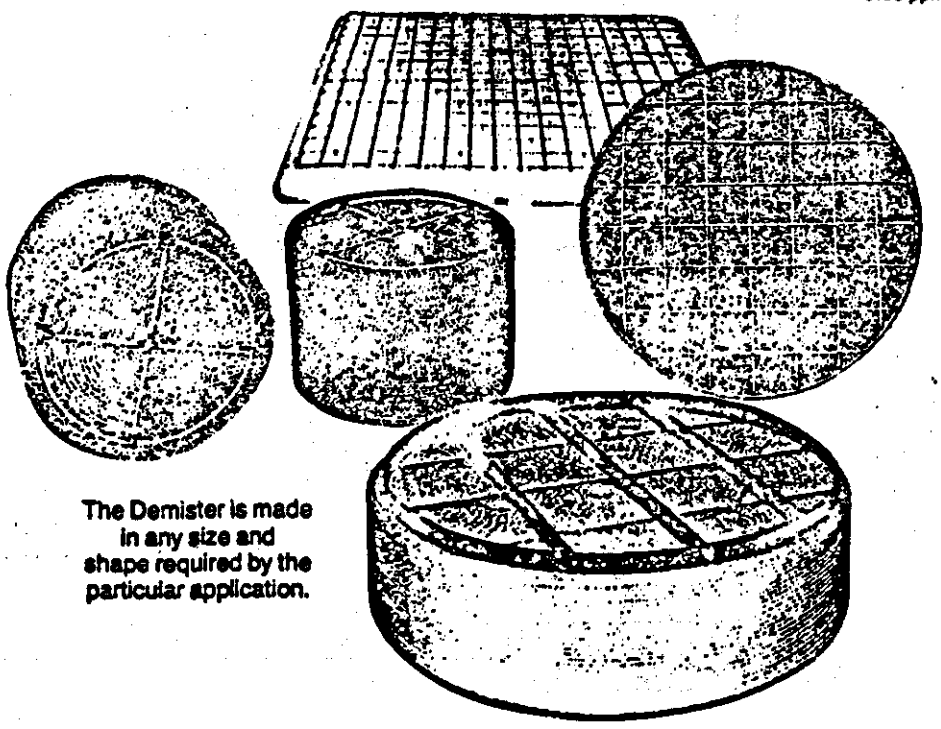
The Demister decreases process costs by: removal of any liquid from air or gas—recovery of fatty acids from steam—recovery of gas oil previously lost to vacuum system—reducing compressor maintenance costs—decreasing size of vessels required for entrainment separation.

In a catalytic cracking unit, compressor maintenance was excessive and valves required replacing in 30 days or less. Heavy gasoline, being carried from the suction header to the compressor intake, was coking valve surfaces. A Demister of Monel installed in the intake line removed the gasoline and the compressor ran over a year without extra maintenance.

Steam Systems

The Demister insures dry steam, and very clean steam with less than 0.5 ppm solids—in boiler steam drums, in boiler feedwater evaporators, in waste heat steam generators.

In a power plant, boiler feedwater make-up was produced by a 1600 square foot, 33,000 pound per hour submerged tube evaporator. To reduce the total dissolved solids of the evaporator condensate to levels acceptable for a 1500 psi boiler, a Demister was installed in the evaporator vapor space. With a shell TDS concentration as high as 3600 ppm, solids content in the condensate was measured to be less than 0.05 ppm.



The Demister is made in any size and shape required by the particular application.

What it is

The Demister manufactured exclusively by York is specially designed and fabricated of knitted wire or plastic mesh. It is made to any required size or shape and may be installed in any new or existing process vessel. The finest quality materials and workmanship go into every Demister; wire is smooth, clean and bright for rapid liquid drainage, stainless steel is fully annealed to provide maximum corrosion resistance. Mesh and supporting grids are carefully constructed to assure perfect fit, eliminating vapor by-passing.

How it works

When vapor carrying entrained liquid droplets or mist passes through the Demister, the vapor moves freely through the mesh but the liquid droplets, having greater inertia, contact the wire surfaces and are briefly held there. As more droplets collect, they grow in size, run off and fall free. The overhead product is pure vapor containing no liquid. Properly applied to the specific process condition the Demister achieves 99.9%+ separation of liquid entrainment from any vapor stream.

Scrubbers

The Demister effectively separates liquids and gasses. A 2'-3" × 18'-10" Demister in a horizontal inlet gas scrubber removes natural gasoline from 160 MM SCFD natural gas at 600 psig and 75°F, with the effluent gas guaranteed to contain no more than 0.1 gallon of liquid hydrocarbons per million ACFM.

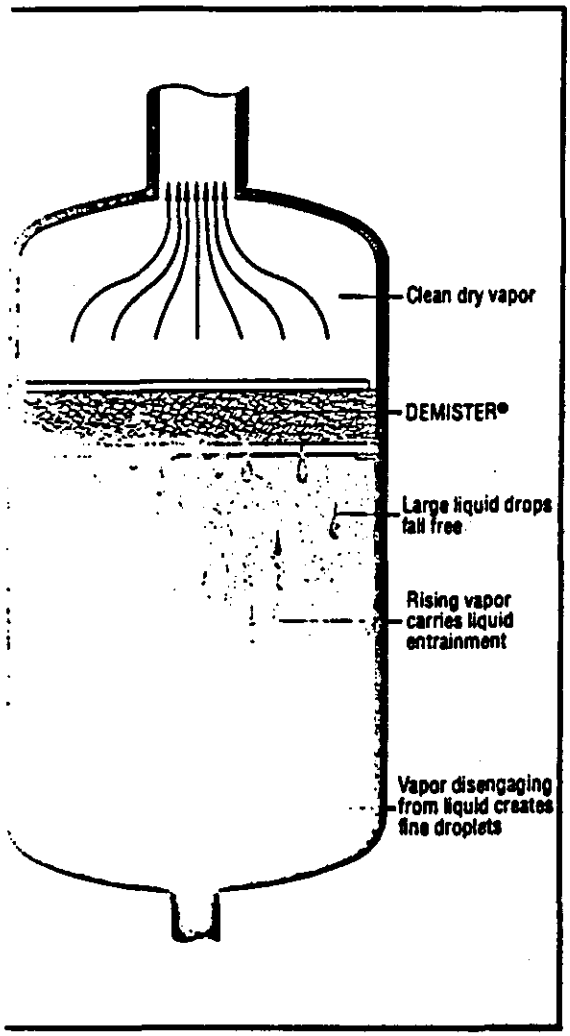
Absorbers

The Demister effects a substantially complete removal of all types of liquid entrainment—absorption oil, glycol and amine solutions—and gives clean dry gas, with substantially no liquid losses.

A glycol absorber equipped with a vane type mist extractor in a gasoline plant continued to experience glycol entrainment loss. The installation of a Demister of 18-8 stainless steel resulted in additional glycol recovery sufficient to pay for the complete installation in 29 days.

Refinery Vacuum Towers

The Demister permits operation at higher throughput rates and improves the quality of gas oil while permitting deeper cutting into the reduced



crude. The improved gas oil, having lower carbon, asphalt and catalyst-poisoning metals, serves to increase cracking capacity due to reduced load on the regenerator, and gives higher gasoline yields by maintaining higher catalyst activity.

A Type 304 stainless steel Demister installed in a reduced crude vacuum tower in an eastern refinery made possible a simultaneous 30-35% increase in feed capacity and a substantial reduction in carbon content of the overhead gas oil.

Refinery Lube Towers

The Demister makes possible increased throughput, yield, and product quality which results in substantial savings in subsequent processing.

A Demister was installed in a vacuum tower charging 25,000 bbl/day of reduced crude and producing overhead and side draw lube distillate cuts. It (a) improved the quality of the lube distillate thus reducing the cost of subsequent treatment,

(b) permitted a 20% increase in throughput rate

(c) made possible the use of a lower cost crude which previously could not be used because color specifications could not be met.

Demister styles and materials

There's a Demister style and material for every purpose. The correct one will provide any performance required for any operating condition.

Style 421—a heavy duty high efficiency style used where entrainment must be reduced to an insignificant quantity. Has high hydraulic shock capacity, and is recommended for heavy entrainment loading. Often used 4 inches thick; greater thickness may be used where higher separation efficiency is required, or for wide fluctuations in vapor rate.

Style 422—a recent development recommended for all services requiring high separation efficiency to provide substantially complete entrainment removal. Excellent for distillation towers, evaporators, absorbers, etc., where it is normally used 4-6 inches thick.

Style 420—a rugged construction for high efficiency requirements involving pulsating or rapidly changing gas or vapor flow rates.

Style 431—a good all around style for efficient performance. Gives excellent service in distillation towers, evaporators, scrubbers, compressor suction drums, etc. Usually used 4-6 inches thick or thicker for higher performance requirements.

Style 931—a popular improved construction which provides for high throughput capacity and low solids retention. Used for good separation efficiency with viscous or dirty liquids, and permits higher than average vapor velocities. A low cost style used 6 inches thick or more.

Style 320—an ultra-efficient style preferred for use with fine particle entrainment for the maximum degree of separation. Recommended for producing high purity condensate in boiler feed water use, for radioactive decontamination, and with troublesome materials such as glycols, amines, etc. Generally used 4-12 inches thick depending upon performance requirements.

Style 644—an anti-fouling style designed for severe operating conditions where fouling may occur. Gives longer life in refinery vacuum towers where coking takes place, in evaporators having high suspended solids concentration, etc. Usually used 6-8 inches thick for optimum performance.

Style 241—polypropylene construction for corrosion resistance at moderate temperatures.

Style 221—a fluoropolymer construction for extremely corrosive services.

There are many other styles including 481, 482 and 483 which have been developed for use in specific applications.

The type and style of Demister for any application can best be determined by York engineers. Consult them for their recommendations.

MATERIALS OF CONSTRUCTION FOR USER'S SELECTION

Material	Liquid Product Separated
304 stainless 304L	water solutions, nitric acid, reduced crude, petroleum fractions, etc.
316 stainless 316L	fatty acids, reduced crude containing naphthenic acids, and other corrosives
317L stainless	high purity fatty acids
430 stainless	nitric acid, water, steam
Monel	caustic soda, alkalis, dilute acids
Nickel	caustic soda, food products
Alloy 20CB-3 Inconel Alloys Incoloy Alloys Hastelloy Alloys Titanium Tantalum	as required for organic acids, minerals acids, alkalis and other corrosives at high temperatures —oxidizing or reducing conditions
Aluminum	nitric acid
Copper	freons, alcohol
Polypropylene	for corrosive service at moderate temperatures
Teflon®, Halar®, Kynar®	for extremely corrosive service
Any other materials which can be drawn or extruded.	

Engineering data

Design Velocity

The allowable vapor velocity through the Demister is influenced by a number of factors which include viscosity, surface tension, particle size, and quantity of entrainment. The vapor density and the liquid density may be used to approximate the optimum vapor velocity in the following equation:

$$U = K\sqrt{\frac{D_L - D_V}{D_V}}$$

U = velocity, ft/sec. D_L = liquid density, lbs/ft³
K = constant = 0.35 D_V = vapor density, lbs/ft³

The value of 0.35 for K applies to free flowing liquid systems and excellent performance will be obtained in most systems for velocities from 30 to 110% of the calculated velocity. For all other conditions, consult York for a recommendation.

Pressure drop

For process equipment applications the pressure drop is usually negligible, ranging from less than 0.1" to 1" water, depending on the system properties and the combined vapor and liquid loading.

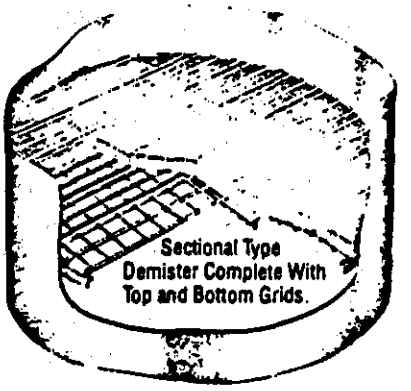
Demister selection

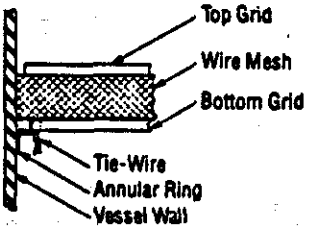
The design and selection of the proper Demister can best be obtained by presenting detailed information to York. Include the following wherever possible:

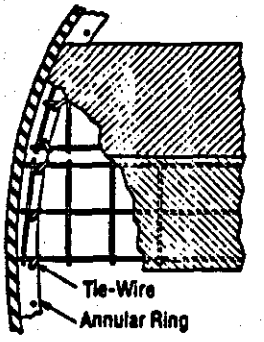
1. Vapor Velocity
2. Vapor Density
3. Liquid Density
4. Liquid Viscosity
5. Surface Tension
6. Liquid Particle Size and Quantity, or Process and System Description
7. Operating Temperature and Pressure
8. Material of Construction
9. Performance Requirements

With this data York will assume the responsibility of supplying the Demister which will give you optimum performance at minimum cost.

Installation details







Each wire mesh section is fastened securely to the individual grid sections. The wire mesh and grids are cut to size and conform to the appropriate curvature to insure a proper fit in the vessel. The wire mesh is resilient and will fit tightly in the vessel. It is not necessary to tie adjacent sections. To support the Demister, the user must weld a support ring 2" to 3" wide inside the vessel. The ring must be drilled with ⅛" to ¼" holes to be used for anchoring grid sections to the ring support with tie wire supplied by York. For standard grids, the maximum distance recommended between supports is 6 feet. For larger diameter vessels, suitable intermediate supports are required.

Representatives

CALIFORNIA
Mountain View, CA 94043
AF Equipment Co.
1690 Plymouth St.
Telephone: 415-965-2525

Pasadena, CA 91105
F&F Industries
65 W. Del Mar Blvd.
Telephone: 213-681-2731
Telex: 675405

ILLINOIS
Chicago, IL 60605
Somes-Nick & Co.
407 So. Dearborn St.
Telephone: 312-427-5892
Telex: 25-4129

LOUISIANA
Baton Rouge, LA 70816
Sample Bros., Inc.
4207 Rhoda Drive
Telephone: 504-293-0180
Telex: 58-6355

MISSOURI
St. Louis, MO 63144
Process Engineering & Equipment Co.
710 Hanley Industrial Court
Telephone: 314-644-2244

OKLAHOMA
Tulsa, Oklahoma 74145
The Canada Co.
4145 S. 87th East Ave.
Telephone: 918-622-5400

OREGON
Portland, Oregon 97202
The Burhans-Sharpe Co.
3777 S.E. Milwaukie Ave.
Telephone: 503-235-8403
Telex: 36-0699

PENNSYLVANIA
Pittsburgh, PA 15202
Budd Equipment Co.
454 Teece Ave.
(P.O. Box 4100)
Telephone: 412-761-2200

TEXAS
Houston, Texas 77027
Rainey Engineering, Inc.
P.O. Box 22186
Telephone: 713-622-5911
Telex: 77-5305

WASHINGTON
Seattle, WA 98124
The Burhans-Sharpe Co.
P.O. Box 3906
(2255 Harbor Ave., S.W.)
Telephone: 206-932-1030
Telex: 32-9571

Canada

Calgary, Alberta T2H 0T3
Lee Instrument & Supply Co. Ltd.
6923 Farrell Road, S.E.
Telephone: 403-252-4222
Telex: 038-26634

Vancouver, B.C. V6A 2R1
Industrial Process Heat Engrg., Ltd.
660 Raymur Ave.
Telephone: 604-254-0461
Telex: 045-1370

Don Mills, Ont. M3B 2M5
J.F. Comer Ltd.
1875 Leslie St. Unit 14
Telephone: 416-449-0880
Telex: 069-66858

Dorval, Quebec H9P 1H3
Warco Equipment Ltd.
2057 Chartier Ave.
Telephone: 514-636-1115
Telex: 055-21853

YORK
OTTO H. YORK COMPANY, INC.
P.O. Box 2100
Fairfield, New Jersey 07006
(201) 575-6960/6966 Telex: 139134

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COMMONWEALTH OF PENNSYLVANIA

DEPARTMENT OF ENVIRONMENTAL RESOURCES
Air Quality and Noise Control Program
Post Office Box 2357
Harrisburg, Pennsylvania 17120

TEMPORARY OPERATING PERMIT

Whitmoyer Laboratories, Inc.
19 N. Railroad Street
Myerstown, Pennsylvania 17068

Attention: Mr. Harold M. Huffman
Plant Manager

Application No. 38-313-003

Source Arsenic Evaporation System

Location 19 N. Railroad Street
Jackson Township
Lebanon County

Gentlemen:

In accordance with provisions of Section 6 (1) of the Air Pollution Control Act, the Act of January 8, 1960, P.L. 2119, as amended, and §127.23 of Chapter 127 of the Rules and Regulations of the Department of Environmental Resources, the Department hereby issues this temporary operating permit for the air contamination source described above.

This temporary permit is subject to the following conditions:

(1) This temporary permit is valid only until November 1, 1976.

(2) Issuance of an operating permit or renewal of this temporary permit is contingent upon the fulfillment of the conditions described on the plan approval and below.

Notify the undersigned when the source is ready for issuance of an OPERATING PERMIT as specified in §127.21 of Chapter 127. The OPERATING PERMIT is to be obtained prior to the expiration of this temporary permit.

Date September 1, 1976

Sincerely,

William A. Thompson
Regional Air Pollution Control Engineer
Harrisburg Region

AR 100326

ER-AQ-16:REV. 2/76

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
BUREAU OF AIR QUALITY & NOISE CONTROL
Application for Plan Approval to Construct,
Modify or Reactivate an Air Contamination Source
and/or Air Cleaning Device or for a Permit to Operate

Page ___ of ___

Read the instruction carefully before completing this form. Submit duplicate copies.

Section A Identity and Location of Air Contamination Source

1A. Application is being made for:

- ☐ Construction of New Source
- ☐ Reactivation of a Source
- ☒ Modification of Existing Source
- ☐ Installation of Air Cleaning Device
- ☐ Extension of Plan Approval
- ☐ Amendment to a Previous Application
- ☒ Operating Permit
- ☐ Temporary Operating Permit
- ☐ Extension of Operating Permit

1B. Type of source: Evaporation System #1 (D-160)

1C. Plant in which source is located	1D. Expected date of completion
☐ NEW ☒ EXISTING	December 17, 1976

1E. If source is new, does it replace another source (describe source replaced) ☐ YES ☐ NO

2A. Owner of source	2B. Employer I.D. No. (Federal)
Whitmoyer Laboratories, Inc.	23-164-0660

3A. Owners designation of source and/or plant if any: Myerstown Plant - Bldg. #2

3B. Location of source (Street address or Route No.)	Political Subdivision (Township, etc.)	County
Ramona Road Myerstown PA 17067	Jackson	Lebanon

3C. Mailing address (Street or P.O. Box, City, Zip Code)	3D. Telephone No.
19 N. Railroad St. Myerstown, PA 17067	717-866-2151

4. Official signing application must be an agent of the Company having primary responsibilities for operation of the facility to which this application applies. Although he may not have participated in the design of the facility he should be responsible for approval of the design.

AFFIDAVIT

I Joseph G. Gallogly, Vice President, being duly sworn according to law depose and say that I am the official having primary responsibility for the design and operation of the facilities to which this application applies and that the information included in the foregoing application is true to the best of my knowledge, information and belief.

AR100327

Sworn to and subscribed before me this 21st day of December, 1976.

Joseph G. Gallogly
Signature

Alice M. Trout, Notary Public

Chemical Engineer

Section B – Process Information

1. PROCESS EQUIPMENT

A. Manufacturer of Source	B. Model No.	C. No. of units
1000 gallon evaporator	Std.	1

D. Rated Capacity
700 gallons per hour by design

E. Rate under normal operation (Describe variations)

350 gallons per hour per unit based on heat transfer limitations.

F. Describe the process equipment (Give type, use, product, etc. on attached sheet)
- One 1000 gallon glass-lined vessel with 8" stack
- A 600 ft.^{2} Karbate heat exchanger to preheat the evaporated stream
- One 6" x 24" dia. Teflon York Demister

G. Sketch flow diagram of process giving all (gaseous, liquid, and solid) flow rates (attach separate sheet). Also list all raw materials charged to process equipment and the amounts charged (tons/hour, etc.) at rated capacity (give maximum, minimum and average of both normal and occasional charges).

See Addendum A for proposed design and basis for permit application

2. OPERATING SCHEDULE

24 hours/day 5 days/week 50 weeks/year

3. SEASONAL PERIODS (MONTHS) Depends on sales movement for on-going waste

Operating ___ to ___ Non-Operating ___ to ___

4. Describe fully the facilities provided to monitor and record all operating conditions that may affect the emission of air contaminants. Provide detailed information to show that the facilities provided are adequate.
(a) The pH of the waste water is adjusted to 1.5-2.0 to tie up the aniline as the hydrochloride salt.
(b) The demister has been designed to handle 700 gph (5800#/hour)
(c) The stack will be sampled and also analyzed weekly for arsenic and aniline to be sure emissions are within limits.

5. Describe modifications to process equipment in detail
A demister has been added to the stack and a heater added in the feed line. The operation will be to superheat the waste stream and allow it to flash into the tanks rather than do all evaporation by boiling out of the liquid in the tanks (existing procedure for years)

6. Type and method of disposal of all waste materials generated by this process
(Is a Solid Waste Disposal Permit Needed? ☐ Yes ☒ No).
- The liquid stream is totally contained and recycled.
- The solids are removed as a wet cake by centrifugation. They are then drummed and sent out-of-state for disposal.

7. Briefly describe the method of handling the waste water from this process and its associated air pollution control equipment
(Is a Water Quality Management Permit needed? ☐ Yes ☒ No)
All water is internally recycled except for the evaporated water vapor.

AP-100328

8. Attach any and all additional information necessary to perform a thorough evaluation of the extent and nature of emissions from this process.
See Addendum B

Section C - Control Equipment

1. POTENTIAL PROCESS EMISSIONS (OUTLET FROM PROCESS, BEFORE ANY CONTROL EQUIPMENT)

A. Outlet particulate loading (lbs/hr or gr/SCF Dry)

Under actual plant tests at a flow rate per stack of 2886#/hour, arsenic emission rate is 0.044#/hour

B. Specific gravity of particulate

sp. gr. of $H_3AsO_4 \cdot \frac{1}{2}H_2O$ = 2.11 @ 25°C

C. Attach outlet particle size distribution information

D. Specify gaseous contaminants and concentration (at operating capacity listed under A)

	Contaminant	*Concentration*	
(1)	Aniline	1490 ppm (Vol.)	4.3 lbs/hr
(2)		____ ppm (Vol.)	____ lbs/hr
(3)		____ ppm (Vol.)	____ lbs/hr

E. Outlet volume of exhaust gases

1290 ACFM

@ 212 °F

2. GAS CONDITIONER (IF APPLICABLE)

A. Water quenching ☐ Yes ☐ No

Water injection rate ____ GPM

B. Radiation and convection cooling ☐ Yes ☐ No

C. Air dilution ☐ Yes ☐ No

____ CFM

D. Gas conditioner outlet

____ ACFM @ ____ °F

3 SETTLING CHAMBERS (IF APPLICABLE)

A. Manufacturer

B. Volume of gas handled

____ ACFM @ ____ °F

C. Gas velocity

D. Dimensions

E. Retention time

F. Describe baffling

G. Inlet concentration (lbs/hr or gr/SCF Dry)

H. Outlet concentration (lbs/hr or gr/SCF Dry)

I. Overall efficiency (%)

AR100329

J. Water injection

☐ Yes ☐ No

K. Water injection Rate (GPM)

L. Attach particle size Efficiency curve

Section C Control Equipment, Continued

9. ABSORPTION AND ABSORPTION EQUIPMENT (IF APPLICABLE)

A. Manufacturer	B. Type	C. Model No.
D. Volume of gases handled (ACFM)		F. Inlet temperature (°F)
E. Design inlet volume (ACFM)		G. Pressure drop (water gage)
H. Absorbent or adsorbent	I. Retention time (sec)	
J. Inlet concentration	K. Outlet concentration	L. Overall efficiency (%)

M. Method and frequency of regeneration

N. Describe absorption or adsorption equipment fully

10. OTHER CONTROL EQUIPMENT (IF APPLICABLE)

Demister

A. Manufacturer	B. Type	C. Model No.
York	Teflon- 6" x 24" dia.	Style #221 (Similar to 421)
D. Volume of gases handled (ACFM)	E. Design inlet volume (ACFM)	F. Inlet temperature (°F)
1290 per stack	1862	212
J. Inlet concentration (lbs/hr or gr/SCF Dry)	K. Outlet concentration (lbs/hr or gr/SCF Dry)	L. Overall efficiency (%)
No efficiency	data at this time.	

I. Attach particle size efficiency curve or other efficiency information

K. Describe fully giving important parameters and method of operation

ER-AQ-161 3/73

Section C - Control Equipment, Continued

11. COSTS

A. Cost of all control equipment including installation costs (List individual controls separately)

Demister ———	$ 318
Demister Shell——	$ 672
Installation ——	$ 832
	$ 1,885

B. Estimated annual operating costs

None

12. Describe modifications to control equipment in detail

13. Discuss briefly the noise potential of the process and related control equipment and describe any devices used to reduce noise. Give costs.

Not a problem

14. Attach manufacturer's performance guarantees and/or warrantees for each of the major components of the control system (or complete system).

———

15. Attach the maintenance schedule for the control equipment and any part of the process equipment that if in disrepair would increase the air contaminant emissions. Periodic maintenance reports are to be submitted to the Department.

N.A.

16. Attach any and all additional information necessary to thoroughly evaluate the control equipment.

ER-AQ-16: 3/73

Section D Flue And Air Contaminant Emission Information

1. STACK AND EXHAUSTER

A. Exhauster (attach fan curves) _____ HP @ _____ RPM

B. Stack height (ft)	C. Stack diameter (ft)	D. Weather cap
52 above ground level	0.66	☐ Yes ☒ No

E. Indicate on an attached sheet the location of sampling ports with respect to exhaust fans, breeching, etc. Give all necessary dimensions.

See Addendum C

F. Can the control equipment be bypassed? (If Yes, explain) ☐ Yes ☒ No

2. ATMOSPHERIC EMISSIONS

A. Particulate matter emissions (lbs/hr or gr/SCF Dry)

0.044#/hour of arsenic (0.088 as $H_3AsO_4 \cdot H_2O$)

B. Gaseous contaminant emissions

Contaminants	*Concentration*
(1)	_____ ppm (Vol.) ___ lbs/hr
(2)	_____ ppm (Vol.) ___ lbs/hr
(3)	_____ ppm (Vol.) ___

All gaseous contaminants will be the same as listed in Section C-D, since the demister has little effect on them. They are a function of pH and the degree of salt formation in the feed material.

C. Outlet volume of exhaust gases

1290 CFM

@ 212 °F

almost 100 % Moisture

AR100332

Section E Miscellaneous Information

1. Describe fully the devices to monitor and record the emission of air contaminants. Provide detailed information to show that the facilities provided are adequate. Include cost and maintenance information. Periodic maintenance reports are to be submitted to the Department.

The pH of the feed material and the presence of the demister are sufficient to insure minimal air contamination. However, the stacks will be sampled and analyzed weekly for arsenic and aniline for the record.

Groundlevel concentrations for aniline and arsenic have been calculated and compared with maximum allowable. The results under conditions listed in Section D are as follows:

Aniline - Max. GLC = 0.0187 ppm @ 586 feet from stacks
Max. Allow GLC = 1/200 of T.L.V. = 0.025 ppm
Arsenic - Max. GLC = 0.816 micro G./Cu.M @ 566 feet from stacks
Max. Allow GLC = 1/200 of T.L.V. = 2.5 micro G./Cu.M.

2. Attach Air Pollution Episode Strategy (if applicable)

3. Briefly describe the general nature of the area in which the source is located.

The Myerstown plant is located in a farming community with a very low population density and little in the way of other industries.

4. Attach calculations and any additional information necessary to thoroughly evaluate compliance with all the applicable requirements of Article III of the Rules and Regulations of the Department of Environmental Resources and any requirements promulgated by the Administrator of the United States Environmental Protection Agency pursuant to the Clean Air Act.

See Addendums

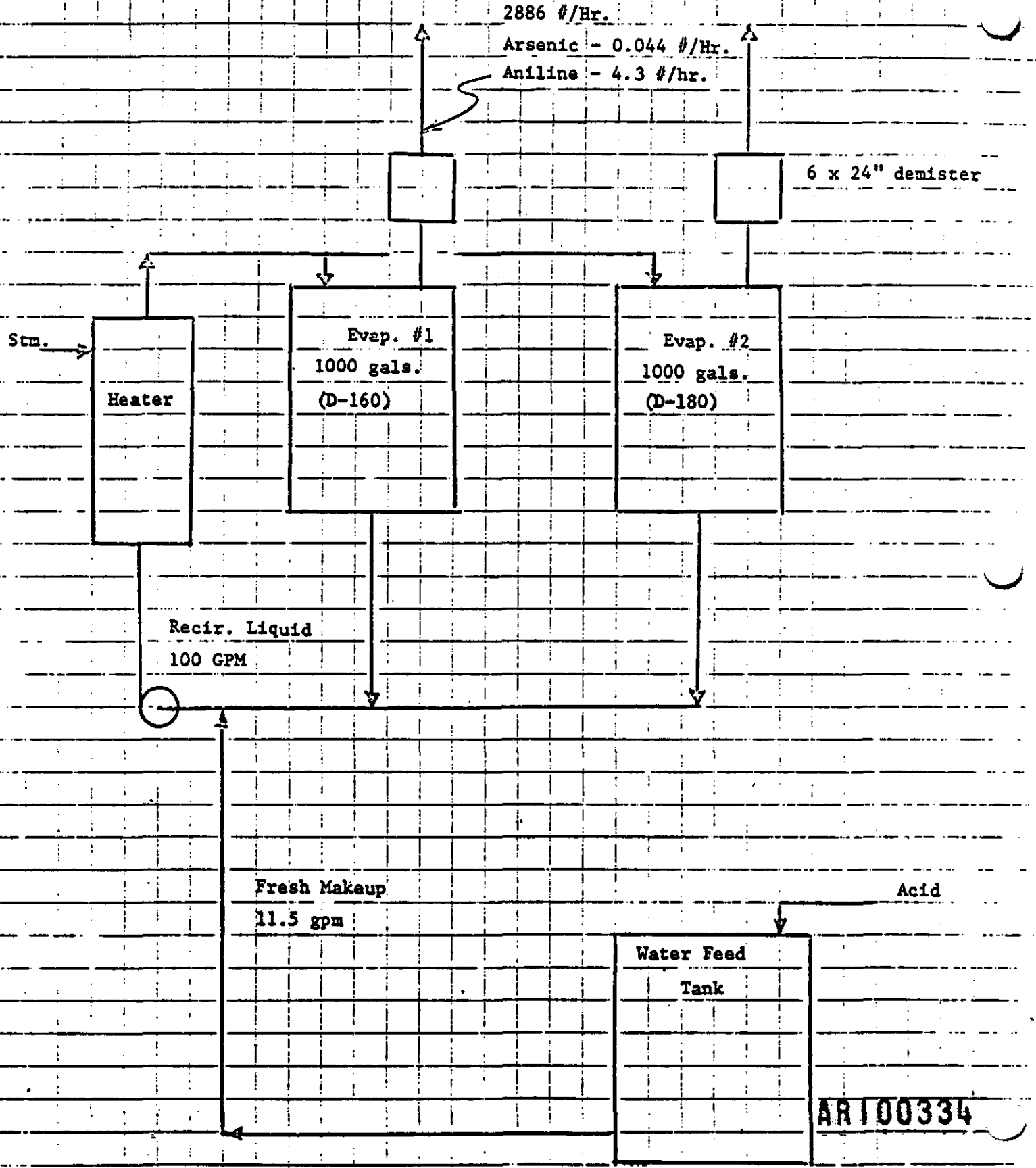
5. List all attachments made to this Application.

Addendum A = Material balance and general operating scheme

Addendum B = Design calculation for demister

Addendum C = Stack sampling orientation

ADDENDUM A



ADDENDUM B

YORK DEMISTER DESIGN

(For containment of particulate arsenic)

Design Basis - 700 gallons per hour of water evaporation @ 212°F

Specific Volumes - Sat'd Vapor @ 212°F = 26.83 ft.^{3}/#
Sat'd Liquid @ 212°F = 0.01672 ft.^{3}/#

$$\text{Design Velocity} = U = K\sqrt{\frac{\rho_c - \rho_v}{\rho_v}}$$

K = 0.35 (assumed)

ρ_c = 1/0.01672 = 59.8#/ft.^{3}

ρ_v = 1/26.83 = 0.0372#/ft.^{3}

$$U = 0.35\sqrt{\frac{59.8 - 0.0372}{0.0372}}$$

$$U = 0.35\sqrt{1606.52}$$

U = 14 ft./sec.

700 GPH = 1.61#/sec. = 43.19 ft.^{3}/sec.

$$\text{Required Demister Area} = \frac{43.19 \text{ ft.}^3/\text{sec.}}{14 \text{ ft./sec.}} = 3.08 \text{ft.}^2$$

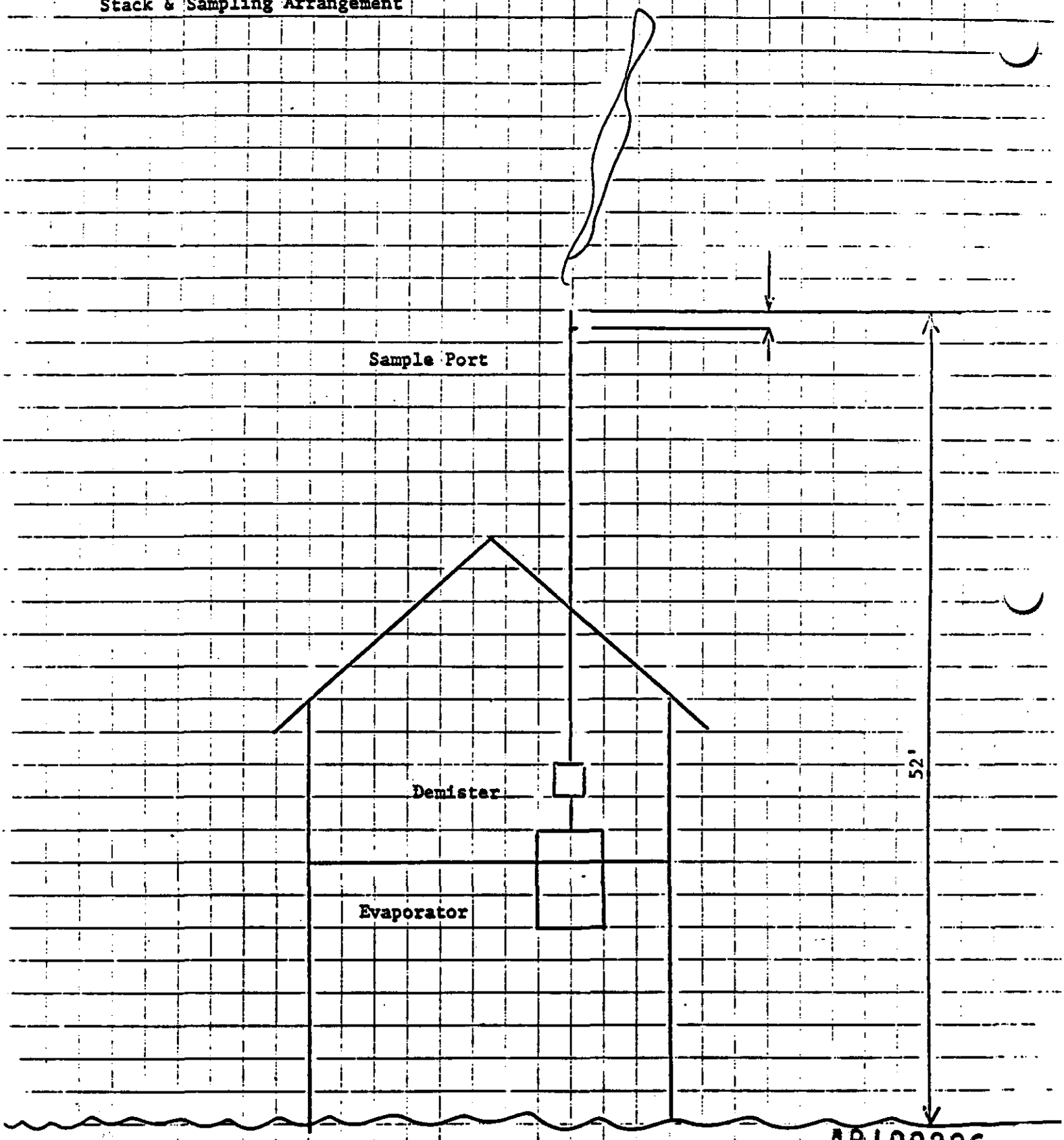
$$A = \frac{\pi D^2}{4} = 3.08 \text{ft.}^2$$

D = 1.98 ft.

Design demister for a 2 ft. diameter (A= 3.14 ft.^{2})

ADDENDUM C

Stack & Sampling Arrangement



COMMONWEALTH OF PENNSYLVANIA

DEPARTMENT OF ENVIRONMENTAL RESOURCES
~~202 Forker Building 302 Market Square~~
~~Harrisburg, Pennsylvania 17101~~
Air Quality and Noise Control Program
Post Office Box 2357
Harrisburg, Pennsylvania 17120

TEMPORARY OPERATING PERMIT

Whitmoyer Laboratories, Inc.
19 N. Railroad Street
Myerstown, Pennsylvania 17068

Attention: Mr. Harold M. Huffman
Plant Manager

Application No. 38-313-003

Source Arsenic Evaporation System

Location 19 N. Railroad Street
Jackson Township
Lebanon County

Gentlemen:

In accordance with provisions of Section 6 (1) of the Air Pollution Control Act, the Act of January 8, 1960, P.L. 2119, as amended, and §127.23 of Chapter 127 of the Rules and Regulations of the Department of Environmental Resources, the Department hereby issues this temporary operating permit for the air contamination source described above.

This temporary permit is subject to the following conditions:

(1) This temporary permit is valid only until January 1, 1977.

(2) Issuance of an operating permit or renewal of this temporary permit is contingent upon the fulfillment of the conditions described on the plan approval and below.

Notify the undersigned when the source is ready for issuance of an OPERATING PERMIT as specified in §127.21 of Chapter 127. The OPERATING PERMIT is to be obtained prior to the expiration of this temporary permit.

Date November 1, 1976

Sincerely,

William A. Thompson
Regional Air Pollution Control Engineer
Harrisburg Region

AR100337

WHITMOYER LABORATORIES, INC.

19 NORTH RAILROAD STREET
MYERSTOWN, PENNSYLVANIA 17067
(717) 866-2151

December 14, 1976

Department of Environmental Resources
Air Quality and Noise Control
P. O. Box 2357
Harrisburg, PA 17120

ATTN: Mr. Desai

Dear Sir:

The temporary operating permit for Whitmoyer's Arsenical Waste Water Treatment System (Application No. 38-313-003) expires on January 1,1977, and application is hereby made for a permanent operating permit. Additional data has been gathered during the period the temporary permit has been in effect and [illegible] application which is attached.

[illegible]uestions, please contact myself or [illegible].

Sincerely,

Joseph Gallagher
Chemical Area Manager

JG:lcb

Attachment

AR100338